

REMARKS

Claims 12-37 are pending in this application. Claims 12-15, 18-22, 24, 26 and 28 have been withdrawn by the Examiner as relating to a non-elected invention.

Claims 23, 25, 32, 33, 36 and 37 have been amended, without prejudice, to specify that the polymerization is conducted in the presence of at least one urea compound selected from the group consisting of urea, thiourea, ethyleneurea, ethylenethiourea, phosphates of guanidyl urea, and sulfates of guanidyl urea. These amendments are supported in the specification at page 29, lines 8-13. No new matter has been added to the application by the foregoing amendments.

This Amendment is being filed concurrently with a Request for Continued Examination. Applicants respectfully request that this Amendment be considered and entered into the file record.

Also, this Amendment is being filed concurrently with the Declaration of Mr. Yuji Baba ("Baba Declaration"). Mr. Baba is working with the inventors of the present application. Mr. Baba is familiar with the subject matter disclosed in the application, the rejection of claims 16, 17, 27, 29-31, 34 and 35 under 35 U.S.C. §103(a) as unpatentable over Oguni et al. (U.S. Patent 5,698,627) in view of Butler (U.S. Patent 3,288,770) and claims 23, 25, 32, 33, 36 and 37 under 35 U.S.C. §103(a) as unpatentable over Oguni et al. in view of Butler as applied above, and further in view of Miyamoto et al. (JP 2000-160499 A), as well as the disclosures in the cited references. Baba Declaration at paragraph 1.

Mr. Baba graduated from Tottori University with a Bachelor's degree in material science in March of 1995. Baba Declaration at paragraph 2. Mr. Baba entered Seiko PMC Corporation in April of 1995 and was assigned to the Polymer Research Laboratory. Since then he has been engaged in development of and research on papermaking chemicals. Baba Declaration at paragraph 2.

Mr. Baba carried out an experiment to demonstrate the patentability of claim 16 of the present invention over Oguni et al. in view of Butler. Baba Declaration at paragraph 3. Mr. Baba's experiment was designed to show whether diallyldimethylammonium chloride taught by Butler would be a comparable replacement for monomer (a) of the present invention according to claim 16. Baba Declaration at paragraph 3.

For the purpose of comparison, Mr. Baba selected the formulation and preparation of Working Example 13 of the specification for comparison, because this example employed, as monomer (a), PAHETMC, or 2-propene-1-aminium, N-hydroxyethyl-N, N, 2-trimethyl chloride, which was considered to be structurally most similar to diallyldimethylammonium chloride used in Example 1 of Butler, among monomers (a) used in the working examples of the present specification. Baba Declaration at paragraph 3.

Mr. Baba followed the exact steps of Example 13 except that PAHETMC was replaced with diallyldimethylammonium chloride. However, the obtained product was gelled and could not be evaluated. Baba Declaration at paragraph 3.

According to Mr. Baba, if this experiment had produced some usable polymer for comparison, he intended to prepare 2-propene-1-aminium, N-propyl-N,N,2-trimethyl chloride as monomer (a), which was considered to be structurally most similar to diallyldimethylammonium chloride within the scope of claim 16. Baba Declaration at paragraph 3. However, Mr. Baba did not conduct further experiments to prepare this compound for monomer (a) of the present invention, since the comparative example using diallyldimethylammonium chloride formed an unusable gel. Baba Declaration at paragraph 3.

In Mr. Baba's opinion, the existence of a second double bond in diallyldimethylammonium chloride contributed to gelation of the polymerized product. Baba Declaration at paragraph 3. Therefore, although Butler's monomer, which requires two double bonds in a molecule as an essential feature, may have some structural similarity to monomer (a) of present claim 16, a product obtained by polymerizing Butler's diallyldimethylammonium chloride monomer with monomers (b), (c1) and (c2) as well as the crosslinking agent (d) of the present invention gelled and was completely useless as a papermaking additive. Baba Declaration at paragraph 3.

Applicants respectfully request that the comparative testing discussed above and in Mr. Baba's Declaration be considered with respect to the rejections discussed below. The undersigned attorney had a telephone interview to discuss which prior art was the closest to the present invention, in the Examiner's opinion, and to formulate a strategy for suitable comparative testing. The Examiner stated that U.S. Patent No. 3,288,770 of Butler was the closest prior art for comparison and that the diallyldimethylammonium chloride monomer of Example 1 of Butler would be a suitable monomer to compare. Accordingly, Applicants

have conducted this testing and presented the results above for consideration.

Claims 16, 17, 27, 29-31, 34 and 35 have been rejected under 35 U.S.C. §103(a) as being obvious over Oguni et al. (U.S. Patent No. 5,698,627) in view of Butler (U.S. Patent No. 3,288,770) for the reasons set forth in paragraph 6 of the prior Office Action of September 12, 2007 ("Prior Office Action"). The reasons for rejection are set forth in detail in the Prior Office Action and, for brevity, are not repeated herein.

Applicants respectfully, but strenuously, traverse and request reconsideration and withdrawal of the rejection.

As reiterated by the Supreme Court in *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. ___, 82 U.S.P.Q.2d 1385 (2007), the framework for the objective analysis for determining obviousness under 35 U.S.C. §103 is stated in *Graham v. John Deere*. Examination Guidelines for Determining Obviousness Under 35 U.S.C. 103 in View of the Supreme Court Decision in *KSR International Co. v. Teleflex Inc.*, 72 Fed. Reg., No. 195 (October 10, 2007) at page 57527 (hereinafter "Examination Guidelines"). The factual inquiries enunciated by the Court are as follows:

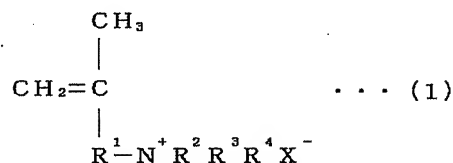
- (1) Determining the scope and content of the prior art;
- (2) Ascertaining the differences between the claimed invention and the prior art; and
- (3) Resolving the level of ordinary skill in the pertinent art.

Examination Guidelines at page 57527.

"The ultimate determination of patentability must be based on consideration of the entire record, by a preponderance of evidence, with due consideration to the persuasiveness of any arguments and any secondary evidence." Manual of Patent Examining Procedure, (Sept. 2007) §716.01(d) and In re Oetiker, 24 U.S.P.Q.2d 1443, 1444 (Fed. Cir. 1992).

The present invention provides a papermaking chemical containing a (meth)acrylamide polymer, produced by polymerizing a monomer (a) expressed by the following general Formula 1, the following monomer (b), and the following monomer (c):

(a) general Formula 1:



where R¹ is a C₁ to C₄ alkylene group, R² to R⁴ are each a hydrogen atom or C₂₂ or lower alkyl group that may have a substituent (two or three of R² to R⁴ may not be hydrogen atoms), and X⁻ is an anion of an inorganic acid or an organic acid;

(b) a (meth)acrylamide; and

(c) an ionic monomer other than monomer (a) expressed by general Formula 1 above.

As discussed in prior responses, Oguni et al. does not suggest or disclose suitable monomers (a). This is acknowledged at page 4 of the Prior Office Action. The Prior Office Action relies upon the disclosure of Butler for this component.

At col. 2, lines 5-27, Butler discloses quaternary ammonium cations having **two** vinyl groups, or two **allyl** groups bonded to the nitrogen atom. On the other hand, monomer (a) of the present invention has only **one** vinyl group attached to the nitrogen atom through R¹. R¹ is a C₁ to C₄ alkylene group. Each of R², R³ and R⁴ is a hydrogen atom or C₂₂ or lower alkyl group that may have a substituent. Therefore, at col. 2, lines 5-27 Butler teaches monomers that are chemically different from monomer (a) of the present claims and will react differently to form different products. The Final Office Action of March 25, 2008 alleges that Butler teaches quaternary ammonium chloride salt monomers that are analogous to Formula (1) of claim 16. However, Butler's quaternary ammonium cations are not analogous to Formula (1) of claim 16, because they provide linear polymers having a linear chain of repeating rings with quaternary ammonium salt groups. The repeating units of the obtained polymers are shown in the lower part of column 2 of the reference.

The (meth)acrylamide polymer described in claims 16, 17, 27, 29-31, 34 and 35 does not include repeating rings resulting from monomer (a). In the field of polymer synthesis, the number of the double bonds which a monomer has, and which can be involved in the polymerization, provides substantial effects on the structure of the produced polymer. Butler's quaternary ammonium cations with two reactive double bonds are not analogous to monomer (a) and would produce a different product from that which is presently claimed.

Applicants have submitted herewith the results of comparative testing using a diallyldimethylammonium chloride monomer taught by Butler and have shown that this monomer forms an unusable gel when used as monomer (a) in the composition of the present invention.

Thus, one of ordinary skill in the art would not use the teaching of quaternary ammonium cations with two reactive double bonds of Butler in the polymerization of Oguni et al. as the resulting product would be different from the desired product of the present claims.

Therefore, the presently claimed invention is not obvious over the combined teachings of Oguni et al. and Butler and Applicants respectfully request that the rejection be reconsidered and withdrawn.

Claims 23, 25, 32, 33, 36 and 37 have been rejected under 35 U.S.C. §103(a) as being obvious over Oguni et al. and Butler as applied to claims 16, 17, 27, 29-31, 34 and 35 above, and further in view of Miyamoto et al. (JP 2000-160499 A) for the reasons set forth in paragraph 7 of the Prior Office Action.

With regard to the limitations of claims 23, 25, 32, 33, 36 and 37, the Prior Office Action acknowledges that the combined teachings of Oguni et al. and Butler do not disclose that the polymerization is conducted in the presence of a urea compound.

Miyamoto et al. allegedly discloses an additive for papermaking comprising a copolymer obtained by copolymerizing an acrylamide, such as (meth)acrylamide with an anionic vinyl monomer selected from itaconic acid, acrylic acid or its salt, a cationic monomer and N',N bis[(meth)acrylamidoalkylene]urea (abstract).

The Prior Office Action concludes that it would have been obvious to one having ordinary skill in the art at the time the invention was made to add urea compound as taught by Miyamoto et al. during the polymerization process of acrylamide polymer composition of Oguni et al. and Butler, with reasonable expectation of success, which lengthened the distance between polymerization nature double bonds, giving the filterability and yield nature in order to achieve an excellent effect while maintaining paper durability (JP '499, page 2, [0010]), and thus to arrive at the subject matter of claims 23, 25, 32, 33, 36 and 37.

Thus, the rejection concludes that the combination of Oguni et al., Butler and Miyamoto et al. renders all instant claims *prima facie* obvious in the absence of unexpected results commensurate in scope with the claims.

In the Final Office Action, it is noted that Applicants contend that Miyamoto et al. teaches the employment of N,N'-bis[(meth)acrylamidoalkylene]urea (JP 2000-160499, [0024]), which are completely different from the structure of the specific species of the urea compounds used in the present invention, such as urea, thiourea, ethyleneurea, ethylenethiourea, and phosphates and sulfates of guanidyl urea (the specification, page 29) (page 7, the last paragraph).

In response to Applicants' argument that the references fail to show certain features of Applicants' invention, the Final Office Action noted that the features upon which Applicants rely (i.e., specific species of the urea) are not recited in the rejected claim(s).

Applicants respectfully, but strenuously, traverse and request reconsideration and withdrawal of the rejection.

As discussed above, Oguni et al. does not suggest or disclose monomer (a) of the presently claimed invention. Butler's discloses quaternary ammonium cations having **two** vinyl groups, or two **allyl** groups bonded to the nitrogen atom. The monomer (a) of the present invention has only **one** vinyl group attached to the nitrogen atom through R¹. As discussed in detail above, Butler's quaternary ammonium cations are not analogous to Formula (1) of claim 16, and when tested in a composition of the present invention formed an unusable gel. Miyamoto et al. does not suggest or disclose monomers such as those of Formula (1) of claim 16. The teachings of Miyamoto et al. do not cure this deficiency in the combined teachings of Oguni et al. and Miyamoto et al.

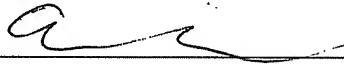
Further, Miyamoto et al. teaches the employment of N,N'-bis[(meth)acrylamidoalkylene]urea, which has the structure shown in paragraph [0024] of the JP 2000-160499 publication. Claims 23, 25, 32, 33, 36 and 37 of the present application have been amended to clarify that the urea compound(s) are selected from urea, thiourea, ethyleneurea, ethylenethiourea, and phosphates and sulfates of guanidyl urea, and combinations thereof. The structure of N, N' -bis[(meth)acrylamidoalkylene]urea is completely different from the structures of the specific species of the urea compound set forth in claims 23, 25, 32, 33, 36 and 37 of the present application. Accordingly, Applicants respectfully request reconsideration and withdrawal of this rejection.

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In view of the foregoing remarks, it is respectfully submitted that all of the pending claims in the present application are distinguishable from the cited prior art. Accordingly, reconsideration and a Notice of Allowance are respectfully requested.

Respectfully submitted,
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